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# Uncovering Tacit Knowledge in Construction Industry: Communities of Practice Approach

Khairil Hizar Md Khuzaimah* and Fadzil Hassan

*Universiti Teknologi MARA, Shah Alam, Selangor 40450, MALAYSIA*

**Abstract**

The ability to capture and manage project knowledge in a systematic manner has always been a significant challenge to the construction industry due to its fragmented and transient nature. The issue is compounded by the fact that most of the knowledge resides in people's heads and exists in the form of tacit knowledge. The objective of this paper is to explore how Communities of Practice (CoPs) can facilitate construction-related organizations to capture and manage project knowledge with particular attention given to tacit knowledge by critically reviewing the literature on the relationship between knowledge, the construction industry and Communities of Practice.



*Keywords*: Knowledge; construction industry; communities of practice; Tacit knowledge

## 1. Introduction

Due to the fragmented and transient nature of the construction industry, the ability to capture and manage project knowledge in a systematic manner has always been a significant challenge and a highly debated issue among scholars and practitioners (Eliufoo, 2008). The problem is compounded by the fact that most of the knowledge resides in people's heads and often exists in the form of tacit knowledge. As a

* Corresponding author. Tel.: +6-013-333-1312; fax: +6-003-5521-1564.
*E-mail address*: khairilhizar@gmail.com


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result, the industry continues to struggle in finding the best possible solutions to leverage on the valuable intellectual asset in order to ensure long term growth and success (Rezgui, 2001).

Tacit knowledge is characterized by unstructured and hidden knowledge which is acquired over a period of time through experience, reflection and intuition. It is difficult, if not impossible to be extracted as compared to explicit knowledge (Davenport & Prusak, 2000; Nonaka & Takeuchi, 1995). In view of tacit knowledge as a process, it puts emphasis on ways to nurture, share and sustain knowledge through open and informal learning approaches such as Communities of Practice (CoPs) and other various forms of social interaction techniques (Alavi & Leidner, 2001; Chong, Salleh, Ahmad, & Sharifuddin, 2011). On the contrary, the perils of viewing tacit knowledge as a thing or an object that can be codified, manipulated and transferred may prevent individuals to appreciate the richness of knowledge.

Communities of Practice, recognized as one of the most important vehicles in knowledge management, has gained a surge in popularity in recent years due to its open and and collaborative approach in sharing tacit knowledge (Du, 2008; Schenkel & Teigland, 2008). Taken this into consideration, this paper aims to explore how CoPs can facilitate construction-related organizations to capture and manage their project knowledge with special attention given to tacit knowledge by critically reviewing the literature on the relationship between knowledge in the construction industry and the concept of communities of practices.

The rest of the article is set out as follows. The next section presents a review of literature on knowledge, Malaysian construction industry and the issues and challenges faced by the industry in capturing and managing knowledge relating to and arising from a project at various stages of the project life cycle, starting from project inception to project decommissioning. Following that are discussions about the concept of Communities of Practice and how CoPs can provide the much needed support in uncovering tacit knowledge in project.

## 2. Knowledge: An Overview

In today's knowledge-based economy, knowledge is widely considered as the most important organizational resource and is therefore critical for the long term sustainable competitive advantage and success of any organization (Alavi & Leidner, 2001; Davenport, Long, & Beers, 1998; Drucker, 1993; Nonaka & Takeuchi, 1995). Unlike traditional resources such as land, labour and capital which tends to depreciate with use and over time, knowledge as an intangible resource will continue to appreciate in value with use (Davenport et al., 1998).

In general terms, knowledge can be divided into two primary categories, explicit and tacit knowledge (Nonaka & Takeuchi, 1995; Polanyi, 1966). Explicit knowledge can be explained as the type of knowledge that can be articulated, codified and stored without much difficulty. Reports, standard operating procedures and manuals are good examples of explicit knowledge. On the other hand, tacit knowledge is highly personal, which makes it difficult to articulate or share with others. It is contextual and is obtained through experience, observation and reflection (Davenport & Prusak, 2000; Quintas, 2005). These knowledge resources of explicit and tacit are best represented via the knowledge iceberg metaphor (Haldin-Herrgard, 2000; Pathirage, Amaratunga, & Haigh, 2007) where the tip of the iceberg (the visible area) constitutes structured, explicit knowledge whilst the part beneath the surface is harder to express, tacit knowledge.

Tacit knowledge can be further separated into two types; the first being cognitive knowledge which consists of mental beliefs, intuition and hunches while the second type is technical knowledge, the know-how and skills (D'Eredita & Barreto, 2006). According to Polanyi's (1966) epistemological view, tacit knowledge will remain inaccessible and thus it is impossible to make them explicit. It can never be taught or explained. From another point of view, Nonaka and Takeuchi (1995) suggest otherwise. According to them, given the right tools and techniques, individuals will be able to uncover and share their tacit

knowledge to others. This is reflected in their widely accepted knowledge creation and conversion model which consists of four knowledge conversion process namely Socialization (from tacit knowledge to tacit knowledge), Externalization (from tacit knowledge to explicit knowledge), Combination (from explicit knowledge to explicit knowledge) and Internalization (from explicit knowledge to tacit knowledge) (SECI) (see Fig.1). This widely accepted model aptly demonstrates the dynamic process of interaction that exists between tacit and explicit knowledge.

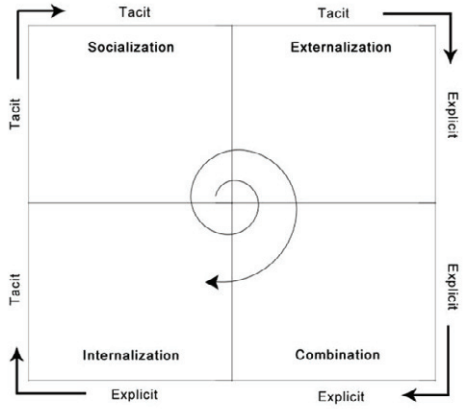


Fig. 1. The SECI model ; Source: Nonaka and Takeuchi, (1995)

A lot of efforts in the past have been focusing on extracting and capturing explicit knowledge since it is much easier to handle and share as compared to tacit knowledge (Ahmed, Lim, & Loh, 2001). Furthermore, most organizations found that the process of extracting tacit knowledge is just too laborious and not worth the effort. However in recent years, scholars have continuously highlighted the importance of tacit knowledge to the organizations and greater efforts must be made to leverage on its huge potential (Beesley & Cooper, 2008; Schenkel & Teigland, 2008). This can be achieved by means of socially interacting with others closely over a period of time which includes learning by doing and learning by watching as demonstrated in techniques such as Communities of Practice, apprenticeship and mentoring (Nonaka & Takeuchi, 1995; Wenger & Snyder, 2000).

## 3. Malaysian Construction Industry

The construction industry plays an important role in enhancing the Malaysian economy and the national welfare. With its average contribution of 3.2% in the nation's Gross Domestic Product (GDP) from 2006 till 2011 (Bank Negara, 2011), it has consistently been one of the critical sectors in Malaysia which help to drive the nation's economy. Although the industry contributes a small proportion of the nation's GDP, it serves as a catalyst and driving force to the other sectors such as manufacturing, services and financing to grow and expand. Together with the launching of the 10th Malaysia Plan and introduction of the Economic Transformation Program (ETP), the outlook for the nation's construction industry looks positive and promising in the near future.

Nonetheless, although the construction industry is currently experiencing a period of sustained and gradual economic growth over the past a couple of years; 2010: 5.2% and 2011: 5.4% (Bank Negara, 2011), the industry continues to face the challenging task of addressing the issues associated with project implementation such as project delays and cost overruns that are negatively affecting the overall image of the industry (Kamara, Augenbroe, Anumba, & Carrillo, 2002). In addition, despite the advancement in

construction techniques and technologies, the industry is still struggling to meet the ever increasing demands of the stakeholders for better return on the investment made.

As it stands, it is no more sufficient to deliver projects within the cost, time and quality stipulated at the beginning of the projects. There have been calls for better return in value for the long term such as energy-efficiency buildings and focus on health and safety aspects. Undoubtedly the construction industry will be under the microscope over the next few years to come as the public will be critical of the performance of the industry.

Thus, as part of the government initiative to tackle the issues previously mentioned, coupled with the unrelenting commitment to improve the performance of the industry, the government has initiated a 10-year strategic transformation plan by introducing Construction Industry Master Plan (CIMP) (CIDB, 2006). The plan is designed with the goals of enhancing the nation's construction industry, improving the overall performance and to position the industry to be among the best in the world. Its main mission is to transform the Malaysian construction industry into a dynamic, productive and resilient enabling sector and to support the nation's overall economic growth.

Among the seven strategic thrusts proposed by the master plan, a special attention has been given to knowledge and in particular, about the significance of knowledge sharing among the major players of the industry as recommended in recommendation 6.1: Encourage knowledge sharing for continuous improvement under the Strategic Thrust No 6: To leverage on Information Communication Technology (ICT) in the construction industry. It recommends that knowledge sharing should be nurtured and cultivated among the diverse stakeholders in pursuing continuous improvement for the industry.

## 4. The Challenge of Managing Knowledge in Construction Industry

As one of the major industries which operate in an information-rich environment, the construction industry relies heavily on knowledge as one of the strategic resources to ensure the tasks associated with the domain can be performed effectively and efficiently by the project team members (Egbu & Robinson, 2005). Thus, knowledge must be deliberately and consciously managed in a systematic manner to enable organizations to achieve improved performance, avoid repetition of costly mistakes and reinvention of wheels (Lin & Lin, 2006).

However, the process of managing knowledge in the construction industry is not an easy task and it requires a thorough planning and preparation. Due to the intrinsic characteristic of the construction industry that is highly fragmented and transient in nature, the success rate of managing project knowledge has been somewhat minimal (Lin & Lin, 2006). Furthermore, taken into consideration the different stages involve in the life cycle of a project starting from inception to decommissioning stage; the amount of knowledge to be captured and managed can be overwhelming at times. Apart from the issue of knowledge glut, part of the reasons for the difficulty in managing project knowledge is also caused by the fact that most of the project knowledge such as technical procedures, project-related problems and solutions, best practices and lesson learned often resides in the heads of project managers, engineers and other project team members, in the form of tacit knowledge. Unless necessary steps are taken to better manage the knowledge, the valuable project knowledge risks of being lost forever when the project team is disbanded at the end of a project and team members move on their separate ways to new projects (Anumba, Egbu, & Carrillo, 2005).

Most of the initiative thus far has been focusing on capturing and managing explicit knowledge, often supported by technology especially ICT, with lack of attention given to tacit knowledge. This is rather unfortunate as it prevents the opportunities for the industry to tap on the hidden reservoirs of valuable knowledge. Reflecting on the unique characteristics of tacit knowledge which is personal and hidden, it cannot be extracted or shared through the formal process of learning and techniques commonly associated

with explicit knowledge. The process of uncovering tacit knowledge can only be achieved by means of social interaction between individuals (Nonaka and Takeuchi, 1995). The challenge, therefore, is to identify the right technique that is able to uncover and at the same time facilitate the process of knowledge sharing. With this in mind, a technique such as Communities of Practice offers the best possible solution to the issue.

## 5. Communities of Practice

The term Communities of Practice was first introduced by Jean Lave and Etienne Wenger in the early 1990s to describe as a network of highly-motivated and dedicated individuals with a common interest, beliefs and understandings of a particular topic that interact regularly for the purpose of sharing knowledge and fostering learning activities (Wenger & Snyder, 2000). This semi-formal and self-governing group is focused on joint collaboration and mutual sharing of knowledge and experience among members and is intended to complement existing structures in organizations (Hearn, 2009).

The technique, which has its origin in the field of social theory of learning, is underpinned by the idea of collective and situated learning that takes place among individuals (Iaquinto, Ison, & Faggian, 2011; Wenger & Snyder, 2000). Learning itself is a process of social action and in order for an individual to learn, the person must continue to interact with others (Haldin-Herrgard, 2000). With its main focus on people, it continues to grow as one of the key techniques in knowledge management by helping to connect and bringing people in a friendly environment to pool their expertise collectively and further deepen their knowledge thorough knowledge sharing activities (Celia, 2006). Organizations such as Xerox, Royal Dutch Shell, NASA and BP have benefitted greatly over the years from the initiative and these organizations continue to provide the support and resources needed to ensure the longevity and success of CoPs which exist within their organizations.

A CoP is a unique entity as compared to a project team in the sense that it does not possess the formal structure like the latter and the membership is based on voluntary commitment rather than compulsory. Members are free to leave the community at any time if they so desire. CoPs may comprise of individuals from inside and outside of the organization. CoPs help to build relationships and instill the element of trust and mutual respect among members. Furthermore, due to the dynamic and fluid objectives that exist in a CoP, the community will continue to exist and remain active as long as the members see interest and value in the topic and benefit from the inherent rewards of knowledge sharing (Du, 2008).

There are three main characteristics that help to distinguish CoPs from other type of structures and the effectiveness of it depends on the strength of these interconnected elements (see Fig. 2) (Wenger & Snyder, 2000):

- The domain: CoPs members are underpinned by a shared meaning and understanding of a particular interest or topic.
- The community : Relationships are built upon trust and respect which eventually helps to instill the sense of belonging among CoPs members. This will encourage members to interact with each other in an open and collaborative approach which in turns provide a foundation for mutual learning among diverse members.
- The practice : Held together by a common body of knowledge, CoPs members continue to develop a shared repertoire of resources, experiences, stories, tools and procedures that inform a collection of actions in addressing recurring problems.

## 6. Uncovering Tacit Knowledge in Construction Industry via Communities of Practice

Looking from the perspective of the construction industry, there are a number of attributes of CoPs that can significantly facilitate in bringing into surface the hidden tacit knowledge while simultaneously providing other salient benefits to the industry as described as follows:

- Open forum for discussion : As the majority of the project knowledge is in the form of tacit knowledge and exist in an unstructured form which makes it difficult for it to be documented and transferred, CoPs offer an effective platform for uniting individuals from different backgrounds and cultures to share and exchange their knowledge and experience by participating in collaborative and friendly environment through informal discussions and open dialogues (Nonaka & Takeuchi, 1995; Schenkel & Teigland, 2008; Tan et al., 2010). By socially of interacting and engaging with each others, members can contribute different perspectives and ideas on certain topics or issues while concurrently help to uncover the tacit knowledge that is often hidden. This process is made easier with the help of a set of shared values and beliefs possessed by the members.
- Efficient problem solving tool : CoPs can act as a practical and efficient problem solving tool (Wenger & Snyder, 2000). Through the process of continuous inquiries that takes place in CoPs, constructive inputs and opinions received from the members help to expedite the speed of generating solutions to overcome the problems being discussed. This is most useful in a situation where a problem which required immediate attention is encountered. For instance, a quantity surveyor who is having difficulty in understanding a certain contract clause can communicate with his or her peer network of practitioners in order to collectively finding the possible solution to the issue.
- Source of best practices and lesson learned : Taking into consideration the considerable amount of new knowledge being generated in projects, it often leads to the establishment of best practices, lesson learned and success stories. These valuable groups of knowledge can be shared during the CoPs sessions and members can engage in open discussions to discuss different possibilities on how to utilize and further improve them. At the same time, this helps to keep everyone abreast with the current knowledge and thinking in specific domains.
- Fostering professional development: CoPs can serve as a good induction or starting point for beginners who are new to the topics to get intellectual insight and access to expertise from the more experienced members. This opportunity is hardly available to them in their normal office settings. It would provide them rooms to further develop their professional skills, knowledge and attitude which are much needed to excel in their career (Du, 2008). Concurrently by continuing to interact with the other members, it will foster a good relationship between them irregardless of their formal positions.
- Virtual learning communities: With the advent of information technology and the introduction of web 2.0-based applications such wikis, blogs, Facebook and Twitter, there has been a considerable growth of virtual CoPs nowadays which enable members from different geographical locations to connect and be able to interact with each other on a regular basis. (Du, 2008). Although the face to face experience is missing in this context, it provides a good alternative for members to be in touch with each other.

## 7. Conclusion

It is critically vital to leverage on the valuable project knowledge that exist in the construction industry domain especially the tacit knowledge that resides in human minds as it makes up a substantial proportion of the intellectual asset much needed towards the achievement of improved performance and sustainable competitive advantage. CoPs serve as a vehicle for industry professionals from different backgrounds and expertise to interact regularly in a knowledge friendly environment to share their thoughts and exchange ideas about topics that they are passionate about. Through the process of open dialogues and informal

discussions, the much sought after project knowledge and experience can be extracted and shared for the benefit of everyone in the communities.

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